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Applicant: M.L. LAMB et al.
Serial No.: 09/972.386
Filed: October 5, 2001
Group Art Unit: 2194
Docket No.: SJO920010037US1

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Name: Janaki K. Davda

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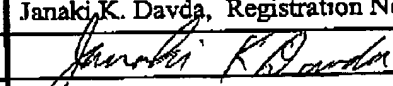
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TRANSMITTAL FORM	Application Number	09/972,386
<i>(To be used for all correspondence after initial filing)</i>	Filing Date	October 5, 2001
	Inventor	M.L. LAMB et al.
	Group Art Unit	2194
	Examiner Name	Qing Yuan Wu
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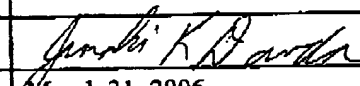
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Date:	March 31, 2006
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FEE TRANSMITTAL	Application Number	09/972,386
for FY 2005	Filing Date	October 5, 2001
	Inventor	M.L. LAMB et al.
	Group Art Unit	2194
	Examiner Name	Qing Yuan Wu
Total Amount of Payment: \$ 500.00		Attorney Docket Number
		SJO920010037US1

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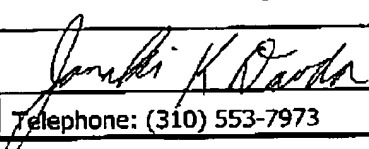
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 - ☐ Submission after final (37 CFR 1.129(a)) **\$790**
 - ☐ Request for Continued Examination (RCE) **\$790**
 - ☐ Other:

SUBTOTAL \$ 500.00

Submitted by:

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In the United States Patent and Trademark Office
Board of Patent Appeals and Interferences

Appeal Brief

In re the Application of:

Michael Loren Lamb and Raymond Matthew Swank

Serial No. 09/972,386
Filed: October 5, 2001
Attorney Docket No. SJO920010037US1

STORAGE AREA NETWORK METHODS AND APPARATUS
FOR STORAGE DEVICE MASKING

Submitted by:

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I. Real Party in Interest

The entire right, title and interest in this patent application is assigned to real party in interest International Business Machines Corporation.

II. Related Appeals, Interferences, and Judicial Proceedings

Appellant, Appellant's legal representative, and Assignee are not aware of any other prior or pending appeals, interferences, and judicial proceedings which may be related to, directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

III. Status of the Claims

Claims 1-26 are pending and have been rejected in view of prior art. The final rejection of the claims is being appealed for all pending claims 1-26.

IV. Status of Amendments

An amendment to the claims was filed on January 3, 2006 in response to a Final Office Action dated October 31, 2006. In an Advisory Action (mailed on January 17, 2006), the Examiner indicated that the amendments are entered and that the 101 rejection issued in the Final Office Action is withdrawn.

V. Summary of the Claimed Subject Matter

Independent claim 1 describes a storage area network (SAN) comprising one or more digital data processors in communication with one or more storage devices (e.g.,

Specification, page 28, lines 8-14). At least a selected one of the digital data processors operates under an operating system having a port driver defining a software interface between a class driver and an adapter to which one or more of the storage devices are coupled (e.g., Specification, page 28, lines 14-17). The class driver is for claiming one or more of the storage devices for access by the operating system and any application programs executing therein by invoking the port driver to which the selected digital data processor is coupled (e.g., Specification, page 28, lines 17-19). A filter is in communication with the port driver and the class driver, the filter intervening to block claiming of one or more of the storage devices by the class driver (e.g., Specification, page 28, lines 19-21; page 138, lines 9-13; Figure 36). The class driver issues a claim request to the port driver for a selected one of the storage devices, and the port driver issues a response to the class driver (e.g., Specification, page 140, lines 8-11). The filter intercepts the response from the port driver, determines whether the selected storage device has been assigned to the selected digital data processor, and, based on the determination, determines whether to allow the response from the port driver to pass to the class driver (e.g., Specification, page 140, lines 15-23; page 141, lines 1-15).

Claim 9 describes that the port driver identifies the one or more storage devices coupled to the adapter, and the class driver invokes the port driver during initialization of the operating system for purposes of claiming the one or more storage devices identified by the port driver as being coupled to the selected digital data processor (e.g., Specification, page 141, lines 17-23). The filter responds to identification of a storage device for which storage device claiming is not to be blocked and for which storage device claiming had previously been blocked by invoking the port driver for purposes of

claiming the one or more storage devices identified by the port driver as being coupled to the selected digital data processor (e.g., Specification, page 141, lines 17-23).

Independent claim 10 describes a storage area network (SAN) comprising one or more digital data processors in communication with one or more storage devices (e.g., Specification, page 28, lines 8-14). At least a selected one of the digital data processors operates under a Windows(TM) operating system having a port driver defining a software interface between a class driver and an adapter to which one or more of the storage devices are coupled (e.g., Specification, page 28, lines 14-17; page 29, lines 1-4). The class driver is for claiming one or more of the storage devices for access by the operating system and any application programs executing therein by invoking the port driver to which the selected digital data processor is coupled (e.g., Specification, page 28, lines 17-19).

A manager digital data processor is coupled to the selected digital data processor and assigns one or more selected storage devices thereto, where the manager digital data processor communicates identifiers of the selected storage devices to a filter operating in conjunction with the selected digital data processor (e.g., Specification, page 29, lines 10-15). The filter is in communication with the port driver and the class driver, the filter intervening to block claiming of storage devices other than those identified by the manager digital data processor (e.g., Specification, page 28, lines 19-21; page 138, lines 9-13; Figure 36). The class driver issues a claim request to the port driver for a selected one of the storage devices, and the port driver issues a response to the class driver (e.g., Specification, page 140, lines 8-11). The filter blocks such claiming by intercepting the response from the port driver, determines whether the selected storage device has been

assigned to the selected digital data processor, and, in response to determining that the selected storage device has not been assigned, returns a failure code to the class driver in response to its invocation of the port driver for purposes of claiming a storage device (e.g., Specification, page 140, lines 15-23; page 141, lines 1-15).

Independent claim 15 describes a storage area network (SAN) comprising one or more digital data processors in communication with one or more storage devices (e.g., Specification, page 28, lines 8-14). At least a selected one of the digital data processors operates under a Windows(TM) 2000 operating system having a port driver defining a software interface between a class driver and an adapter to which one or more of the storage devices are coupled (e.g., Specification, page 28, lines 14-17; page 29, lines 6-8). The class driver is for claiming one or more of the storage devices for access by the operating system and any application programs executing therein by invoking the port driver to which the selected digital data processor is coupled (e.g., Specification, page 28, lines 17-19).

A manager digital data processor is coupled to the selected digital data processor and assigns one or more selected storage devices thereto, where the manager digital data processor communicates identifiers of the selected storage devices to a filter operating in conjunction with the selected digital data processor (e.g., Specification, page 29, lines 10-15). The filter is in communication with the port driver and the class driver, the filter intervening to block claiming of storage devices other than those identified by the manager digital data processor (e.g., Specification, page 28, lines 19-21; page 138, lines 9-13; Figure 36). The class driver issues a claim request to the port driver for a selected one of the storage devices (e.g., Specification, page 140, lines 8-11). The filter blocks

such claiming by intercepting the claim request from the class driver to the port driver for purposes of claiming a storage device, wherein, in response to determining that the selected storage device has not been assigned to the selected digital data processor, the filter blocks the claim request to prevent the class driver from creating a device object for the selected storage device (e.g., Specification, page 145, lines 7-16).

Independent claim 20 describes a storage area network (SAN) comprising one or more digital data processors in communication with one or more storage devices (e.g., Specification, page 28, lines 8-14). At least a selected one of the digital data processors operates under a Windows(TM) 2000 operating system having a port driver defining a software interface between a class driver and an adapter to which one or more of the storage devices are coupled (e.g., Specification, page 28, lines 14-17; page 29, lines 6-8). The class driver is for claiming one or more of the storage devices for access by the operating system and any application programs executing therein by invoking the port driver to which the selected digital data processor is coupled (e.g., Specification, page 28, lines 17-19).

A plug-n-play manager invokes the port driver to populate a data structure with data pertaining to one or more storage devices that are coupled to the adapter by issuing a request packet (e.g., Specification, page 146, lines 4- 11). A filter in communication with the port driver intercepts the request packet from the plug-n-play manager to the port driver and blocks access to selected ones of the storage devices by determining which ones of the storage devices are to be masked and removing from the data structure at least selected data pertaining those determined storage devices, wherein removal of the

selected data prevents the class driver from creating device objects for the determined storage devices (e.g., Specification, page 146, line 4-page 148, line 11).

Independent claim 22 describes a storage area network (SAN) comprising one or more digital data processors in communication with one or more storage devices (e.g., Specification, page 28, lines 8-14). At least a selected one of the digital data processors operates under a Windows(TM) 2000 operating system having a port driver defining a software interface between a class driver and an adapter to which one or more of the storage devices are coupled (e.g., Specification, page 28, lines 14-17; page 29, lines 6-8). The class driver is for claiming one or more of the storage devices for access by the operating system and any application programs executing therein by invoking the port driver to which the selected digital data processor is coupled (e.g., Specification, page 28, lines 17-19).

A filter is in communication with the port driver and the class driver, and the filter intervenes to block claiming of one or more of the storage devices by the class driver by intercepting a request packet having an associated data structure issued to the port driver and blocking access to selected ones of the storage devices by determining which ones of the storage devices are to be masked and removing from the data structure at least selected data pertaining those determined storage devices, wherein removal of the selected data prevents the class driver from creating device objects for the determined storage devices (e.g., Specification, page 146, line 4-page 148, line 11).

Independent claim 23 describes a method in a storage area network (SAN) comprising one or more digital data processors in communication with one or more storage devices (e.g., Specification, page 28, lines 8-14). At least a selected one of the

digital data processors operates under an operating system having a port driver defining a software interface between a class driver and an adapter to which one or more of the storage devices are coupled (e.g., Specification, page 28, lines 14-17). The class driver is for claiming one or more of the storage devices for access by the operating system and any application programs executing therein by invoking the port driver to which the selected digital data processor is coupled (e.g., Specification, page 28, lines 17-19).

The class driver issues a claim request to the port driver for a selected one of the storage devices, and the port driver issues a response to the class driver (e.g., Specification, page 140, lines 8-11). The filter intercepts the response from the port driver, determines whether the selected storage device has been assigned to the selected digital data processor, and, based on the determination, determines whether to allow the response from the port driver to pass to the class driver (e.g., Specification, page 140, lines 15-23; page 141, lines 1-15).

Independent claim 24 describes a method in a storage area network (SAN) comprising one or more digital data processors in communication with one or more storage devices (e.g., Specification, page 28, lines 8-14). At least a selected one of the digital data processors operates under an operating system having a port driver defining a software interface between a class driver and an adapter to which one or more of the storage devices are coupled (e.g., Specification, page 28, lines 14-17). The class driver is for claiming one or more of the storage devices for access by the operating system and any application programs executing therein by invoking the port driver to which the selected digital data processor is coupled (e.g., Specification, page 28, lines 17-19).

A filter that is in communication with the port driver and the class driver intervenes to block claiming of one or more of the storage devices by the class driver by intercepting a request packet having an associated data structure issued to the port driver and blocking access to selected ones of the storage devices by determining which ones of the storage devices are to be masked and removing from the data structure at least selected data pertaining those determined storage devices, wherein removal of the selected data prevents the class driver from creating device objects for the determined storage devices (e.g., Specification, page 145, line 7 – page 146, line 15).

Independent claim 25 describes a program stored in a computer readable medium in a storage area network (SAN) comprising one or more digital data processors in communication with one or more storage devices(e.g., Specification, page 28, lines 8-14). At least a selected one of the digital data processors operates under an operating system having a port driver defining a software interface between a class driver and an adapter to which one or more of the storage devices are coupled (e.g., Specification, page 28, lines 14-17). The class driver is for claiming one or more of the storage devices for access by the operating system and any application programs executing therein by invoking the port driver to which the selected digital data processor is coupled (e.g., Specification, page 28, lines 17-19).

The class driver issues a claim request to the port driver for a selected one of the storage devices, and the port driver issues a response to the class driver (e.g., Specification, page 140, lines 8-11). The filter intercepts the response from the port driver, determines whether the selected storage device has been assigned to the selected digital data processor, and, based on the determination, determines whether to allow the

response from the port driver to pass to the class driver (e.g., Specification, page 140, lines 15-23; page 141, lines 1-15).

Independent claim 26 describes a program stored in a computer readable medium in a storage area network (SAN) comprising one or more digital data processors in communication with one or more storage devices (e.g., Specification, page 28, lines 8-14). At least a selected one of the digital data processors operates under an operating system having a port driver defining a software interface between a class driver and an adapter to which one or more of the storage devices are coupled (e.g., Specification, page 28, lines 14-17). The class driver is for claiming one or more of the storage devices for access by the operating system and any application programs executing therein by invoking the port driver to which the selected digital data processor is coupled (e.g., Specification, page 28, lines 17-19).

A filter that is in communication with the port driver and the class driver intervenes to block claiming of one or more of the storage devices by the class driver by intercepting a request packet having an associated data structure issued to the port driver and blocking access to selected ones of the storage devices by determining which ones of the storage devices are to be masked and removing from the data structure at least selected data pertaining those determined storage devices, wherein removal of the selected data prevents the class driver from creating device objects for the determined storage devices (e.g., Specification, page 145, line 7 – page 146, line 15).

VI. Grounds of Rejection to Be Reviewed on Appeal

A concise statement listing each ground of rejection presented for review is as follows:

A. Whether claims 1-26 are unpatentable under 35 U.S.C. 103(a) over Kim (U.S. Pub. No. 2002/0069245) in view of Blumenau et al. (U.S. Patent No. 6,810,396).

VII. Argument

A. Rejection Under 35 U.S.C. §103(a) Over Kim (U.S. Pub. No. 2002/0069245) in view of Blumenau et al. (U.S. Patent No. 6,810,396)

1. Claims 1-14, 23, and 25

Claim 1 describes, for example, a filter in communication with a port driver and a class driver, the filter intervening to block claiming of one or more of the storage devices by the class driver. The class driver issues a claim request to the port driver for a selected one of the storage devices, and the port driver issues a response to the class driver. The filter intercepts the response from the port driver, determines whether the selected storage device has been assigned to the selected digital data processor, and, based on the determination, determines whether to allow the response from the port driver to pass to the class driver.

In paragraph 10 of the Final Office Action, the Examiner submits:

Kim does not specifically teach a filter in communication with the port driver and the class driver, the filter intervening to block claiming of one or more selected storage devices by the class driver, and determining whether the selected storage device has been assigned to the selected digital data processor.

However, the Examiner cites the Kim patent application disclosing a filter program. The Kim patent application describes a disk class driver and a NAD port driver (Figure 20B). The disk class driver passes an IRP with an SRB to the NAD port driver

and NAD bus driver, which deliver the CDB extracted from the SRB to the NIC to complete a device I/O to a NAD device (page 11, paragraph 145, Figure 23B). Also, the Kim patent application describes a NAD device is comprised of the NAD controller (page 5, paragraph 89) that executes I/O commands from the host's NAD device driver. A filter program can be installed on the NAD controller to provide access control, access share, and access right transfer (page 6, paragraph 94). Thus, the filter program is installed on the NAD device, and the NAD device driver on the host can request to execute the filter program at the time of I/O command execution (page 6, paragraph 94). By teaching that the filter program is installed on the NAD controller of the NAD device and that the filter program is executed by a request from the NAD device driver on the host, the Kim patent application teaches away from the claimed filter, which is in communication with the class driver and port driver and which intercepts the response from the port driver. In addition, with the Kim patent application, there is no need for the filter program to intercept any response because the filter program execution is specifically requested, and so the Kim patent application teaches away from the claimed subject matter. Also, the filter program of the Kim patent application does not teach or suggest determining whether to allow the response from the port driver to pass to the class driver.

Additionally, the Examiner cites the filter/adaptor unit of the Blumenau patent. The Blumenau patent describes host computers that are coupled to an enterprise storage system through a communications channel, which is shown as a Fibre Channel network (Col. 3, lines 29-31; FIGs. 1-2). The enterprise storage system includes a filter adapter unit that controls access to disk storage devices (Col. 3, line 62-Col. 4, line 2; FIGs. 1-2). The filter adapter unit uses a volume configuration management database (VCMD) (Col. 4, lines 30-31) that includes a filter table for determining which HBAs have access to which of the LUNs (Col. 4, lines 60-65). The filter adapter unit translates packets received from the network into data blocks for forwarding to disk adapters and performs a filtering function (Col. 5, lines 8-16). Also, each host computer includes host bus adapters (HBAs) that are used to couple a bus to the Fibre Channel network (Col. 3, lines 40-53). The filter adapter unit of the Blumenau patent does not teach or suggest the claimed filter. In particular, claim 1 describes that a digital data processor (e.g., a host,

Specification, page 28, lines 14-15) includes a port driver, a class driver, and a filter (e.g., Applicants' FIG. 36). The filter is in communication with the port driver and the class driver and intercepts a response from the port driver to the class driver and determines whether to allow the response from the port driver to pass to the class driver. On the other hand, the filter adapter of the Blumenau patent does not reside at the host computer, sits between a host and disk storage (FIG. 1), and so the filter adapter is not in a position to intercept a response from the port driver to the class driver. That is, the filter adapter of the Blumenau patent does not *intercept* a response from the port driver to a class driver. Instead, the Blumenau patent describes that the filter adapter processes network packets received from the network.

Furthermore, in paragraph 12 of the Final Office Action, the Examiner submits:

Kim and Blumenau does not specifically teach the filter intercepting the response from the port driver, and, based on the determination, determining whether to allow the response from the port driver to pass to the class driver.

The Examiner submits that the Kim patent application discloses the port driver issuing a response to the class driver and that the Blumenau patent discloses allowing only requests from HBAs that are assigned to selected volumes to have access to those volumes of the storage devices. The Examiner further submits that it would have been obvious to prohibit communication between the port driver and class driver, which implicitly prohibits access to the storage device as being considered by the Kim patent application and the Blumenau patent. Applicants respectfully traverse. Because the Kim patent application teaches that a filter is executed by a request from the NAD device driver on the host, the Kim patent application teaches away from the claimed filter, which *intercepts* the response from the port driver to the class driver. The Blumenau patent teaches a filter unit that resides between a host and storage and so is not able to *intercept* a response from a port driver. If the Kim patent application and Blumenau patent were combined, the result would be to have a filter unit separate from the host that is not capable of intercepting responses from the port driver.

The law is well settled that a reference will not support a rejection based upon obviousness where the proposed modification to the reference contravenes the principle of operation of the device of the reference:

If the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims prima facie obvious. In re Ratti , 270 F.2d 810, 123 USPQ 349 (CCPA 1959)

The Examiner appears to be impermissibly modifying the Blumenau patent to move the filter adapter to the host computer from the enterprise storage system, such that the filter adapter is able to intercept a response from the port driver to the class driver. Also, The Examiner appears to be impermissibly modifying the Kim patent application such that the filter program intercepts responses, rather being executed by a request from the NAD device driver on the host.

Thus, Applicants respectfully submit that because the Kim patent application and Blumenau patent describe filtering without intercepting claim requests, these references teach away from the claimed interception of claim requests and the claimed subsequent processing.

In an Advisory Action mailed on January 17, 2006, the Examiner suggested a request with no privilege being prohibited/interrupted/intercepted from accessing the storage device teaches the claimed limitation of the filter intercepting the response from the port driver to the class driver. Applicants respectfully traverse. The Blumenau patent describes the filter adapter unit sitting across a Fibre Channel, between the host and the disk storage devices. That is, the Blumenau patent describes that the filter adapter processes network packets received from the network. The filter adapter is not located at the host and is not able to intercept a response from the port driver to the class driver.

Thus, claim 1 is not taught or suggested by the Kim patent application or the Blumenau patent, either alone or in combination. Claims 23 and 25 not taught or suggested by the Kim patent application or the Blumenau patent, either alone or in combination for at least the same reasons as were discussed with respect to claim 1.

Dependent claims 2 and 4-9 incorporate the language of independent claim 1 and add additional novel elements. Therefore, dependent claims 2 and 4-9 are not taught or suggested by the Kim patent application or the Blumenau patent, either alone or in combination, for at least the same reasons as were discussed with respect to claim 1.

Additionally, claim 9 describes that the filter responds to identification of a storage device for which storage device claiming is not to be blocked and for which storage device claiming had previously been blocked by invoking the port driver for purposes of claiming the one or more storage devices identified by the port driver as being coupled to the selected digital data processor. In paragraph 18 of the Final Office Action, the Examiner submits:

Kim as modified does not specifically teach the filter responds to identification of a storage device for which storage device claiming is not to be blocked and for which storage device claiming had previously been blocked by invoking the port driver for purposes of claiming the one or more storage devices identified by the port driver as being coupled to the selected digital data processor.

However, the Examiner submits that the Kim patent application discloses providing access to privileged requests and blocking out non-privileged requests and that the Blumenau patent describes a management console for updating information. Applicants respectfully submit that this does not teach or suggest the filter invoking the port driver for purposes of claiming the one or more storage devices identified by the port driver.

Claim 10 describes, for example, the filter in communication with the port driver and the class driver, the filter intervening to block claiming of storage devices other than those identified by the manager digital data processor, the class driver issuing a claim request to the port driver for a selected one of the storage devices, the port driver issuing a response to the class driver, the filter blocking such claiming by intercepting the response from the port driver, determining whether the selected storage device has been assigned to the selected digital data processor, and in response to determining that the

selected storage device has not been assigned, returning a failure code to the class driver in response to its invocation of the port driver for purposes of claiming a storage device. Claim 10 is not taught or suggested by the Kim patent application or the Blumenau patent, either alone or in combination, for at least the same reasons as were discussed with respect to claim 1.

Dependent claims 11-14 incorporate the language of independent claim 10 and add additional novel elements. Therefore, dependent claims 11-14 are not taught or suggested by the Kim patent application or the Blumenau patent, either alone or in combination, for at least the same reasons as were discussed with respect to claim 10.

Accordingly, it is respectfully submitted that the rejection of claims 1-14, 23, and 25 as obvious over the Kim and Blumenau combination should be reversed.

2. Claims 15-19, 24, and 26

Claim 15 describes, for example, the filter in communication with the port driver and the class driver, the filter intervening to block claiming of storage devices other than those identified by the manager digital data processor, the class driver issuing a claim request to the port driver for a selected one of the storage devices, the filter blocking such claiming by intercepting the claim request from the class driver to the port driver for purposes of claiming a storage device, wherein, in response to determining that the selected storage device has not been assigned to the selected digital data processor, the filter blocks the claim request to prevent the class driver from creating a device object for the selected storage device.

In paragraph 24 of the Final Office Action, the Examiner submits:

In addition, Kim as modified does not specifically teach wherein the filter blocks the claim request to prevent the class driver from creating a device object for the selected storage device.

However, the Examiner submits that the Kim patent application discloses the port driver issuing a response to the class driver and that the Blumenau patent discloses

allowing only requests from HBAs that are assigned to selected volumes to have access to those volumes of the storage devices. The Examiner further submits that it would have been obvious to prohibit communication between the port driver and class driver, which implicitly prohibits access to the storage device as being considered by the Kim patent application and the Blumenau patent. Applicants respectfully traverse.

Neither the Kim patent application nor the Blumenau patent teach or suggest that a claim request from the class driver is intercepted. Instead, in the Kim patent application, filtering is performed when the filter program is executed by a request from the NAD device driver on the host. In the Blumenau patent, the filtering is performed by a filter adapter that translates packets received from the network into data blocks for forwarding to disk adapters. Applicants respectfully submit that because the Kim patent application and Blumenau patent describe filtering without intercepting claim requests, these references teach away from the claimed interception of claim requests and the claimed subsequent processing.

Thus, claim 15 is not taught or suggested by the Kim patent application or the Blumenau patent, either alone or in combination. Claims 24 and 26 not taught or suggested by the Kim patent application or the Blumenau patent, either alone or in combination for at least the same reasons as were discussed with respect to claim 15.

Dependent claims 16-19 incorporate the language of independent claim 15 and add additional novel elements. Therefore, dependent claims 16-19 are not taught or suggested by the Kim patent application or the Blumenau patent, either alone or in combination, for at least the same reasons as were discussed with respect to claim 15.

Accordingly, it is respectfully submitted that the rejection of claims 15-19, 24, and 26 as obvious over the Kim and Blumenau combination should be reversed.

3. Claims 20-22

Claim 20 describes, for example, a filter in communication with the port driver, the filter intercepting the request packet from the plug-n-play manager to the port driver and blocking access to selected ones of the storage devices by determining which ones of the storage devices are to be masked and removing from the data structure at least selected data pertaining those determined storage devices, wherein removal of the

selected data prevents the class driver from creating device objects for the determined storage devices.

In paragraph 26 of the Final Office Action, the Examiner submits:

Kim as modified does not specifically teach a plug-n-play manager that invokes the port driver to populate a data structure with data pertaining to one or more storage devices that are coupled to the adapter by issuing a request packet, and the filter blocking access to selected ones of the storage devices by determining which ones of the storage devices are to be masked and removing from the data structure at least selected data pertaining those determined storage devices.

However, the Examiner submits that it would have been obvious to include the invoking of the port driver because the port driver is a bridge between the class driver and storage devices and responsible for adding and removing the storage devices and controlling the access of the storage devices by indicating availability/accessibility of the storage devices. Applicants respectfully traverse.

Neither the Kim patent application nor the Blumenau patent teach or suggest intercepting the request packet from the plug-n-play manager to the port driver and blocking access to selected ones of the storage devices by determining which ones of the storage devices are to be masked and removing from the data structure at least selected data pertaining those determined storage devices, wherein removal of the selected data prevents the class driver from creating device objects for the determined storage devices. In particular, neither the Kim patent application nor the Blumenau patent teach or suggest intercepting the request packet from the plug-n-play manager to the port driver. Instead, in the Kim patent application, filtering is performed when the filter program is executed by a request from the NAD device driver on the host. In the Blumenau patent, the filtering is performed by a filter adapter that translates packets received from the network into data blocks for forwarding to disk adapters. Applicants respectfully submit that because the Kim patent application and Blumenau patent describe filtering without intercepting request packets from a plug-n-play manager to the port driver, these

references teach away from the claimed interception of request packets and the claimed subsequent processing.

Thus, claim 20 is not taught or suggested by the Kim patent application or the Blumenau patent, either alone or in combination.

Dependent claim 21 incorporates the language of independent claim 20 and adds additional novel elements. Therefore, dependent claim 21 is not taught or suggested by the Kim patent application or the Blumenau patent, either alone or in combination, for at least the same reasons as were discussed with respect to claim 20.

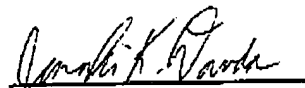
Claim 22 describes, for example, a filter in communication with the port driver and the class driver, the filter intervening to block claiming of one or more of the storage devices by the class driver by intercepting a request packet having an associated data structure issued to the port driver and blocking access to selected ones of the storage devices by determining which ones of the storage devices are to be masked and removing from the data structure at least selected data pertaining those determined storage devices, wherein removal of the selected data prevents the class driver from creating device objects for the determined storage devices. Applicants respectfully submit that because the Kim patent application and Blumenau patent describe filtering without intercepting request packets to the port driver, these references teach away from the claimed interception of request packets and the claimed subsequent processing.

Accordingly, it is respectfully submitted that the rejection of claims 20-22 as obvious over the Kim and Blumenau combination should be reversed.

4. Conclusion

Each of the rejections set forth in the Final Office Action is improper and should be reversed.

Respectfully submitted,



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VIII. Claims Appendix

1. (Previously Presented) In a storage area network (SAN) comprising one or more digital data processors in communication with one or more storage devices, wherein at least a selected one of the digital data processors operates under an operating system having

a port driver defining a software interface between a class driver and an adapter to which one or more of the storage devices are coupled,

the class driver for claiming one or more of the storage devices for access by the operating system and any application programs executing therein by invoking the port driver to which the selected digital data processor is coupled,

the improvement comprising:

a filter in communication with the port driver and the class driver, the filter intervening to block claiming of one or more of the storage devices by the class driver,

the class driver issuing a claim request to the port driver for a selected one of the storage devices,

the port driver issuing a response to the class driver,

the filter intercepting the response from the port driver, determining whether the selected storage device has been assigned to the selected digital data processor, and, based on the determination, determining whether to allow the response from the port driver to pass to the class driver.

2. (Previously Presented) In the SAN of claim 1, wherein the operating system is a Windows NT™ operating system, the further improvement wherein the filter blocks claiming of a selected storage device by returning a failure code to the class driver in response to its invocation of the port driver for purposes of claiming that storage device.
3. (Previously Presented) In the SAN of claim 22, wherein the operating system is a Windows 2000™ operating system, and the filter blocks claiming of a selected storage device by returning a failure code in response to the claim request.
4. (Original) In the SAN of claim 1, the further improvement comprising an element in communication with the filter and transmitting thereto identifiers of one or more storage devices for which claiming is to be any of blocked and not blocked.
5. (Original) In the SAN of claim 4, the further improvement wherein the element comprises a further digital data processor that is coupled for communication with the selected digital data processor.
6. (Original) In the SAN of claim 4, the further improvement wherein

the element transmits to the filter identifiers of one or more storage devices for which claiming is not to be blocked,

the filter intervening to block claiming of fiber channel storage devices other than those identified for which claiming is not to be blocked.

7. (Original) In the SAN of claim 4, the further improvement wherein the class driver creates a disk object upon successfully claiming a storage device, the further improvement comprising an agent that blocks access by the operating system or an application executing thereon to a selected storage device for which such a disk object has already been created by invalidating the disk object for that device and that, optionally, unblocks access to that storage device by re-validating that disk object.

8. (Original) In the SAN of claim 7, the further improvement wherein the agent comprises software executing on the digital data processor.

9. (Previously Presented) In the SAN of claim 4, wherein the

port driver identifies the one or more storage devices coupled to the adapter,

the class driver invokes the port driver during initialization of the operating system for purposes of claiming the one or more storage devices identified by the port driver as being coupled to the selected digital data processor,

the further improvement wherein

the filter responds to identification of a storage device for which storage device claiming is not to be blocked and for which storage device claiming had previously been blocked by invoking the port driver for purposes of claiming the one or more storage devices identified by the port driver as being coupled to the selected digital data processor.

10. (Previously Presented) In a storage area network (SAN) comprising one or more digital data processors in communication with one or more storage devices, wherein at least a selected one of the digital data processors operates under a Windows(TM) operating system having

a port driver defining a software interface between a class driver and an adapter to which one or more of the storage devices are coupled,

the class driver for claiming one or more of the storage devices for access by the operating system and any application programs executing therein by invoking the port driver to which the selected digital data processor is coupled,

the improvement comprising:

a manager digital data processor that is coupled to the selected digital data processor and that assigns one or more selected storage devices thereto,

the manager digital data processor communicating identifiers of the selected storage devices to a filter operating in conjunction with the selected digital data processor,

the filter in communication with the port driver and the class driver, the filter intervening to block claiming of storage devices other than those identified by the manager digital data processor,

the class driver issuing a claim request to the port driver for a selected one of the storage devices,

the port driver issuing a response to the class driver,

the filter blocking such claiming by intercepting the response from the port driver, determining whether the selected storage device has been assigned to the selected digital data processor, and in response to determining that the selected storage device has not

been assigned, returning a failure code to the class driver in response to its invocation of the port driver for purposes of claiming a storage device.

11. (Original) In the SAN of claim 10, the further improvement wherein the selected digital data processor is coupled to the one or more storage devices by a first network.

12. (Original) In the SAN of claim 11, wherein the manager digital data processor is coupled to the selected digital data processors by a second network.

13. (Original) In the SAN of claim 12, wherein the first network comprises fiber channel and the second network is an IP network.

14. (Original) In the SAN of claim 11, the further improvement comprising a graphical user interface coupled to the manager digital data processor that facilitates operator identification of one or more storage devices to be assigned to the selected digital data processor.

15. (Previously Presented) In a storage area network (SAN) comprising one or more digital data processors in communication with one or more storage devices, wherein at least a selected one of the digital data processors operates under a Windows(TM) 2000 operating system having

a port driver defining a software interface between a class driver and an adapter to which one or more of the storage devices are coupled,

the class driver for claiming one or more of the storage devices for access by the operating system and any application programs executing therein by invoking the port driver to which the selected digital data processor is coupled,

the improvement comprising:

a manager digital data processor that is coupled to the selected digital data processor and that assigns one or more selected storage devices thereto,

the manager digital data processor communicating identifiers of the selected storage devices to a filter operating in conjunction with the selected digital data processor,

the filter in communication with the port driver and the class driver, the filter intervening to block claiming of storage devices other than those identified by the manager digital data processor,

the class driver issuing a claim request to the port driver for a selected one of the storage devices,

the filter blocking such claiming by intercepting the claim request from the class driver to the port driver for purposes of claiming a storage device, wherein, in response to determining that the selected storage device has not been assigned to the selected digital data processor, the filter blocks the claim request to prevent the class driver from creating a device object for the selected storage device.

16. (Original) In the SAN of claim 15, the further improvement wherein the selected digital data processor is coupled to the one or more storage devices by a first network.

17. (Original) In the SAN of claim 16, wherein the manager digital data processor is coupled to the selected digital data processors by a second network.

18. (Original) In the SAN of claim 17, wherein the first network comprises fiber channel and the second network is an IP network.

19. (Original) In the SAN of claim 16, the further improvement comprising a graphical user interface coupled to the manager digital data processor that facilitates operator identification of one or more storage devices to be assigned to the selected digital data processor.

20. (Previously Presented) In a storage area network (SAN) comprising one or more digital data processors in communication with one or more storage devices, wherein at

least a selected one of the digital data processors operates under a Windows 2000™ operating system having

a port driver defining a software interface between a class driver and an adapter to which one or more of the storage devices are coupled,

the class driver for claiming one or more of the storage devices for access by the operating system and any application programs executing therein by invoking the port driver to which the selected one of the digital data processors is coupled,

a plug-n-play manager that invokes the port driver to populate a data structure with data pertaining to one or more storage devices that are coupled to the adapter by issuing a request packet,

the improvement comprising:

a filter in communication with the port driver, the filter intercepting the request packet from the plug-n-play manager to the port driver and blocking access to selected ones of the storage devices by determining which ones of the storage devices are to be masked and removing from the data structure at least selected data pertaining those determined storage devices, wherein removal of the selected data prevents the class driver from creating device objects for the determined storage devices.

21. (Previously Presented) In the SAN of claim 20, the further improvement wherein the filter responds to identification of a storage device for which storage device claiming is not to be blocked and for which storage device claiming had previously been blocked by invoking the port driver to populate a data structure with data pertaining to one or more storage devices that are coupled the adapter.

22. (Previously Presented) In a storage area network (SAN) comprising one or more digital data processors in communication with one or more storage devices, wherein at least a selected one of the digital data processors operates under an operating system having

a port driver defining a software interface between a class driver and an adapter to which one or more of the storage devices are coupled,

the class driver for claiming one or more of the storage devices for access by the operating system and any application programs executing therein by invoking the port driver to which the selected digital data processor is coupled,

the improvement comprising:

a filter in communication with the port driver and the class driver, the filter intervening to block claiming of one or more of the storage devices by the class driver by intercepting a request packet having an associated data structure issued to the port driver

and blocking access to selected ones of the storage devices by determining which ones of the storage devices are to be masked and removing from the data structure at least selected data pertaining those determined storage devices, wherein removal of the selected data prevents the class driver from creating device objects for the determined storage devices.

23. (Previously Presented) A method in a storage area network (SAN) comprising one or more digital data processors in communication with one or more storage devices, wherein at least a selected one of the digital data processors operates under an operating system having a port driver defining a software interface between a class driver and an adapter to which one or more of the storage devices are coupled, the class driver for claiming one or more of the storage devices for access by the operating system and any application programs executing therein by invoking the port driver to which the selected digital data processor is coupled, the method comprising:

- issuing a claim request by the class driver to the port driver for a selected one of the storage devices,

- issuing a response by the port driver to the class driver,

- intercepting the response from the port driver by a filter, wherein the filter determines whether the selected storage device has been assigned to the selected digital data processor, and based on said determination, determines whether to allow the response from the port driver to pass to the class driver.

24. (Previously Presented) A method in a storage area network (SAN) comprising one or more digital data processors in communication with one or more storage devices, wherein at least a selected one of the digital data processors operates under an operating system having a port driver defining a software interface between a class driver and an adapter to which one or more of the storage devices are coupled, the class driver for claiming one or more of the storage devices for access by the operating system and any application programs executing therein by invoking the port driver to which the selected digital data processor is coupled, the method comprising:

intervening with a filter in communication with the port driver and the class driver to block claiming of one or more of the storage devices by the class driver by intercepting a request packet having an associated data structure issued to the port driver and blocking access to selected ones of the storage devices by determining which ones of the storage devices are to be masked and removing from the data structure at least selected data pertaining those determined storage devices, wherein removal of the selected data prevents the class driver from creating device objects for the determined storage devices.

25. (Previously Presented) A program stored in a computer readable medium in a storage area network (SAN) comprising one or more digital data processors in communication with one or more storage devices, wherein at least a selected one of the digital data processors operates under an operating system having a port driver defining a software interface between a class driver and an adapter to which one or more of the storage devices are coupled, the class driver for claiming one or more of the storage devices for access by the operating system and any application programs executing therein by

invoking the port driver to which the selected digital data processor is coupled, the program when executed by a computer being capable of:

issuing a claim request by the class driver to the port driver for a selected one of the storage devices,

issuing a response by the port driver to the class driver,

intercepting the response from the port driver by a filter, wherein the filter determines whether the selected storage device has been assigned to the selected digital data processor, and based on said determination, determines whether to allow the response from the port driver to pass to the class driver.

26. (Previously Presented) A program stored in a computer readable medium in a storage area network (SAN) comprising one or more digital data processors in communication with one or more storage devices, wherein at least a selected one of the digital data processors operates under an operating system having a port driver defining a software interface between a class driver and an adapter to which one or more of the storage devices are coupled, the class driver for claiming one or more of the storage devices for access by the operating system and any application programs executing therein by invoking the port driver to which the selected digital data processor is coupled, the program when executed by a computer being capable of:

intervening with a filter in communication with the port driver and the class driver to block claiming of one or more of the storage devices by the class driver by intercepting a request packet having an associated data structure issued to the port driver and blocking access to selected ones of the storage devices by determining which ones of the storage

devices are to be masked and removing from the data structure at least selected data pertaining those determined storage devices, wherein removal of the selected data prevents the class driver from creating device objects for the determined storage devices.

IX. Evidence Appendix

None

X. Related Proceedings Appendix

None